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Comparison of Annex 1 and non-Annex 1 pledges under the Cancún Agreements

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ABSTRACT

This report examines four recent detailed studies of countries' mitigation pledges under the Cancun Agreements, for the purpose of comparing developed (Annex 1) country pledges to developing (non-Annex 1) country pledges. It finds that *there is broad agreement that developing country pledges amount to more mitigation than developed country pledges*. That conclusion is robust, in that it applies across all four studies and across all their various cases, despite the diversity of assumptions and methodologies employed and the substantial differences in their quantification of the pledges. The studies also find that the Annex 1 pledges could be significantly diminished by the lenient accounting rules, specifically with respect to the use of surplus allowances. Other issues (e.g., double counting of offsets and accounting methodologies for land-use, land-use change, and forestry) could further erode the pledges. The studies further note that the mitigation pledged globally is consistent with a global temperature rise of greater than 2°C – and possibly as much as 5°C. Avoiding this much warming would require developed countries to raise their pledges to the levels required by science and equity, and fulfill those ambitions through actual mitigation. While this report concludes that developed country pledges are not high enough, it does not conversely imply that developing country pledges are too high. If the appropriate international institutions of technological cooperation and financial support where put in place, developing countries could also fulfill higher levels of ambition, consistent with keeping warming below 2°C or 1.5°C.

CONTENTS

INTRODUCTION

It is now well understood that the mitigation actions pledged by countries under the Copenhagen Accord and Cancun Agreements are not sufficiently ambitious to avoid dangerous climate change. This was carefully documented in the United Nations Environment Programme's *The Emissions Gap Report* (2010), which concluded that "the range of 2020 emission levels from the Copenhagen Accord pledges tends to be consistent with … pathways that have 'likely' temperature increases of 2.5° C to 5° C up to the end of the twenty-first century" (p.47). Other sources have come to similar conclusions: Climate Action Tracker[1] calculates a range of 2.6°C to 4.0°C. Climate Interactive[2] calculates a range of 2.9°C to 4.3°C.

Keeping warming below the 2°C objective reflected in Cancun Agreements – or below the 1.5°C target advocated by approximately 100 countries and many civil society groups – will require ambition to be ramped up substantially. This leads naturally to questions such as, who has pledged to do how much, and who should do more?

As a small step toward answering these questions, this report examines four recent detailed studies of the mitigation pledges, for the purpose of comparing developed (Annex 1) country pledges to developing (non-Annex 1) country pledges. The chart below is a summary of four well-known sources of information (see references below) on the aggregate impact of the pledges under the Cancun Agreements:

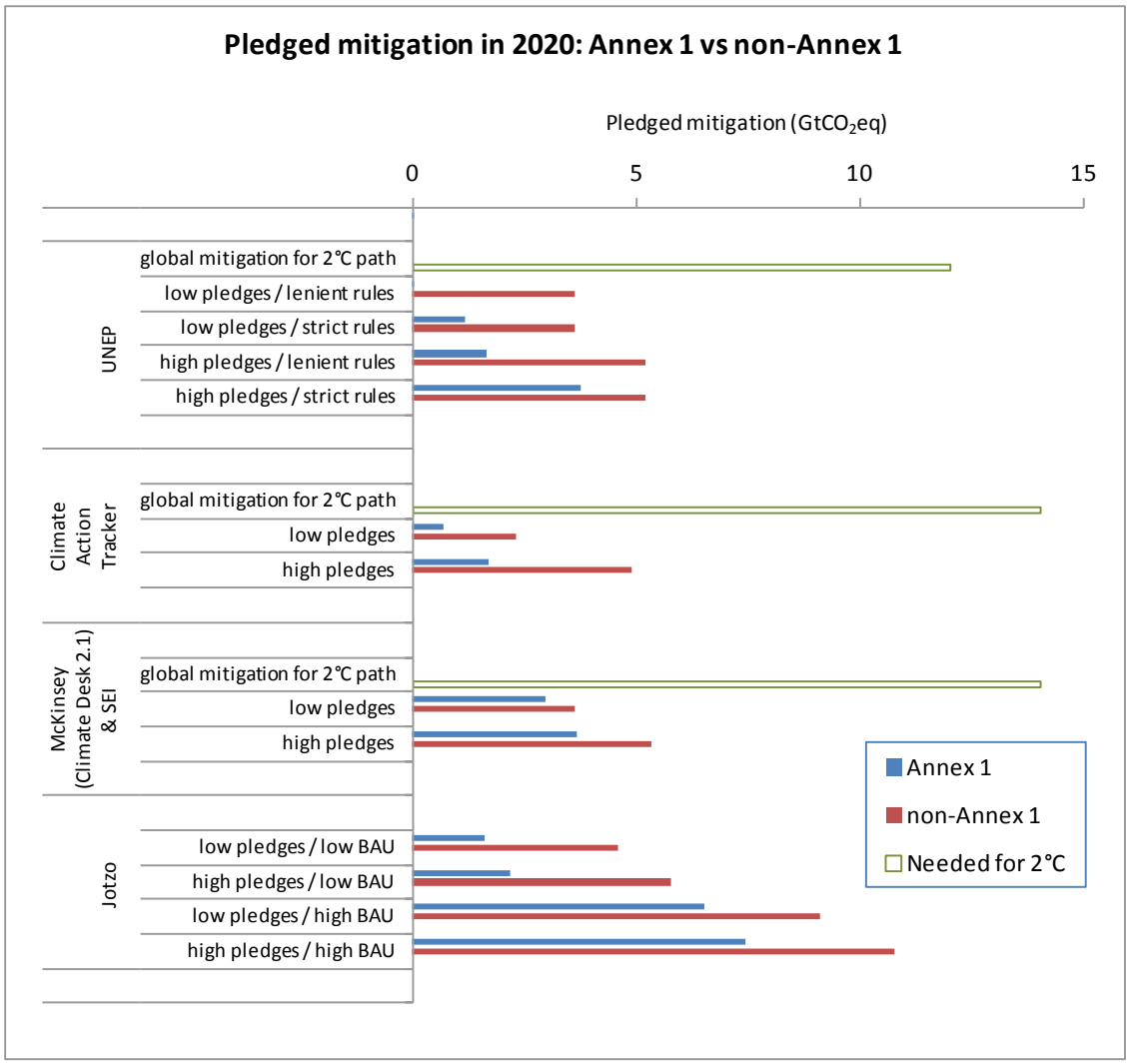
- UNEP: *The Emissions Gap Report* (UNEP 2010 and its appendices), a meta-analysis of 13 studies.
- Climate Action Tracker (Climate Analytics et al. 2010; Chen et al. 2011; Höhne et al. 2011).
- McKinsey & Company *Climate Desk* v2.1 (McKinsey & Company 2011), a widely used source of national business-as-usual emissions pathways, coupled with a further assessment of pledges prepared for a recent Stockholm Environment Institute report (Erickson et al. 2011).
- Frank Jotzo, advisor to the Garnaut Review (Jotzo 2010).

As is shown in the chart, ***there is broad agreement that developing country pledges amount to more mitigation, on an absolute basis, than developed country pledges.*** (Note in the chart that the red bars, which show developing country pledged mitigation, are consistently longer than the blue bars, which show developed country pledged mitigation. The data can be found in tabular form as Table A1 in the Appendix). That conclusion is robust, in that it applies across all four studies and across all their various cases, despite the diversity of assumptions and methodologies employed and the substantial differences in their quantification of the pledges.

In addition, the three studies that compare pledges to the mitigation levels needed to keep warming below 2°C all conclude that they fall far short (as reflected in the fact that the blue and red bars combined are shorter than the corresponding green bars, which shows the study's calculation of the necessary global mitigation). This applies even to the cases that consider the "high pledges" and more strict accounting rules.

[1] See http://www.climateactiontracker.org. The above range was updated to reflect pledges as of 6 April 2011.
[2] See http://www.climateinteractive.org/scoreboard. The above range was updated to reflect pledges as of 2 September 2011.

Figure 1: Comparison of Annex 1 and non-Annex 1 pledged mitigation in 2020, per four analyses



Annex 1 pledges are shown in blue; non-Annex 1 pledges are shown in red. Each of the four analyses shows that developing country pledges imply a greater amount of mitigation.

Comparing pledges is complicated by the fact that countries have expressed their pledges in different ways. Some pledges are expressed as reductions relative to their emission levels (% decline in $GtCO_2e$) in different base years, such as 1990, 1992, 2000, 2005, or a projected business-as-usual (BAU) emissions level in a future year such as 2020. Other pledges are expressed in terms of reductions in carbon intensity of their economies (% decline in $GtCO_2e$/unit of economic value). But, regardless, in each case, the pledge can be converted to an actual emissions target in 2020, and then compared against a plausible reference BAU. This is what each of the four studies has done.

Thus the blue and red bars in Figure 1 show the difference between each study's assumed BAU and its calculation of the pledged emission levels, and reflect the actual amount of mitigation to be achieved in the year 2020, in gigatons of carbon dioxide equivalent ($GtCO_2e$). This corresponds to the goal of comparing the actual mitigation that is being pledged, i.e., the quantity of GHGs that the country is committing to keep out of the atmosphere. It excludes extraneous factors such as the choice of base year for expressing the pledge, or whether the pledge has been presented to the UNFCCC as a reduction in emissions or emissions intensity.

Across the four studies, 12 cases were examined, and all showed the developing countries' pledged mitigation is greater than the developed countries' pledged mitigation.

THE DIFFERENT CASES

Three main factors distinguish the various cases considered by the four studies:

1. Conditionality

All four distinguish in some way between "low" ambition and "high" ambition pledges, reflecting the fact that several countries or regions have made lower pledges that are unconditional, plus higher pledges if specific conditions are met, such as comparable action by other Parties (e.g., EU), or adequate financial and technological support (e.g., Indonesia). In some cases, the range reflects not conditions, but uncertainty about future mitigation potential (e.g., China).

Some countries have only one target (e.g., United States, Japan, Canada), which is conditional on comparable action by other Parties. The various studies treat these pledges differently: some (Climate Action Tracker, McKinsey/SEI, Jotzo) include them in the low and high pledges case, and some (UNEP) include them only in the high pledges case.

Based on the official country submissions to the UNFCCC, studies often attempt to distinguish between developing country pledges that are unsupported, versus those that presuppose financial and/or technological support from developed countries as a conditionality. For many countries, this is fairly clear. For example, some of the major developing country pledges (e.g., China) assume no financial support. Others (e.g., Indonesia) specify an unconditional pledge that is unsupported, and a conditional pledge that is explicitly conditioned on support. However, others (e.g., South Africa) state, without quantifying the specifics, that some efforts will be made unilaterally, but that support would be required for full fulfillment of its pledge. Though there is some ambiguity, the studies are ultimately fairly consistent in their findings about the aggregate developing country "low" and "high" pledges.

2. Accounting rules for Annex 1 countries

The UNEP cases further distinguish between scenarios with "lenient" and "strict" implementation of rules affecting land use, land-use change and forestry (LULUCF) accounting, the use of surplus emission allowances (AAUs) from the Kyoto Protocol's first commitment period after 2012, and the creation of additional surplus AAUs in the second commitment period. There are additional possibilities for "lenient" interpretation of the rules, including the prospect of Clean Development Mechanism (CDM) double-counting and non-additionality (see, for example, Erickson et al. 2011).

3. Future economic growth

The Jotzo cases further distinguish between high economic growth and low economic growth scenarios. The BAU ranges are determined by high and low GDP growth scenarios of the U.S. Energy Information Agency (2010), coupled with emission intensity projections from the EIA (2009), the Australian Treasury (2008), and Garnaut (2008). These BAUs tend to be higher than the others (hence also inferring higher required levels of mitigation), because they explicitly factor out existing climate policy that some other reports tend to include in their BAU projections.

NOTES REGARDING THE INDIVIDUAL STUDIES

UNEP (2010; 2011)

The UNEP study is a meta-analysis of 13 other studies of the Copenhagen/Cancun pledges. The results presented above are primarily taken from the Appendix 2 (UNEP 2011), where detailed information is available that is not included in the aggregate data presented in the main report. The Annex 1 countries detailed in the appendix account for somewhat more than 90% of current Annex 1 emissions, and the non-Annex 1 countries account for somewhat more than 60% of current non-Annex 1 emissions.

The UNEP study considers four cases:[3]

- Case 1: low pledges, lenient rules
- Case 2: low pledges, strict rules
- Case 3: high pledges, lenient rules
- Case 4: high pledges, strict rules

Figure 1 shows the aggregate mitigation pledges from Annex 1 and non-Annex 1 countries in each of these four cases, as well as the UNEP estimate of the required global mitigation (12 $GtCO_2e$ in 2020) consistent with a "likely" 2°C pathway.

UNEP's "lenient rules" cases consider three different mechanisms that could reduce the mitigation effort implemented by Annex 1 countries. The UNEP report states that (i) lax LULUCF rules could diminish effort by 0.8 $GtCO_2e$ in 2020, (ii) surplus first-commitment-period allowances could diminish effort by 1.3 $GtCO_2e$ in 2020, and (iii) additional surplus allowances generated by Russia and Ukraine's new pledges, which exceed their likely BAU emissions, could reduce effort by a further 1 $GtCO_2e$. These three mechanisms sum to approximately 3 $GtCO_2e$. As this considerably exceeds the total sum of proposed Annex 1 low pledges, the "low pledges, lenient rules" case shows zero total mitigation. In the "high pledges, lenient rules" case, Annex 1 pledges are also significantly diminished, though not to zero. Note, however, that this may be an underestimate of the impact of lenient rules, specifically with regard to the surplus allowances. (See discussion under Climate Action Tracker.)

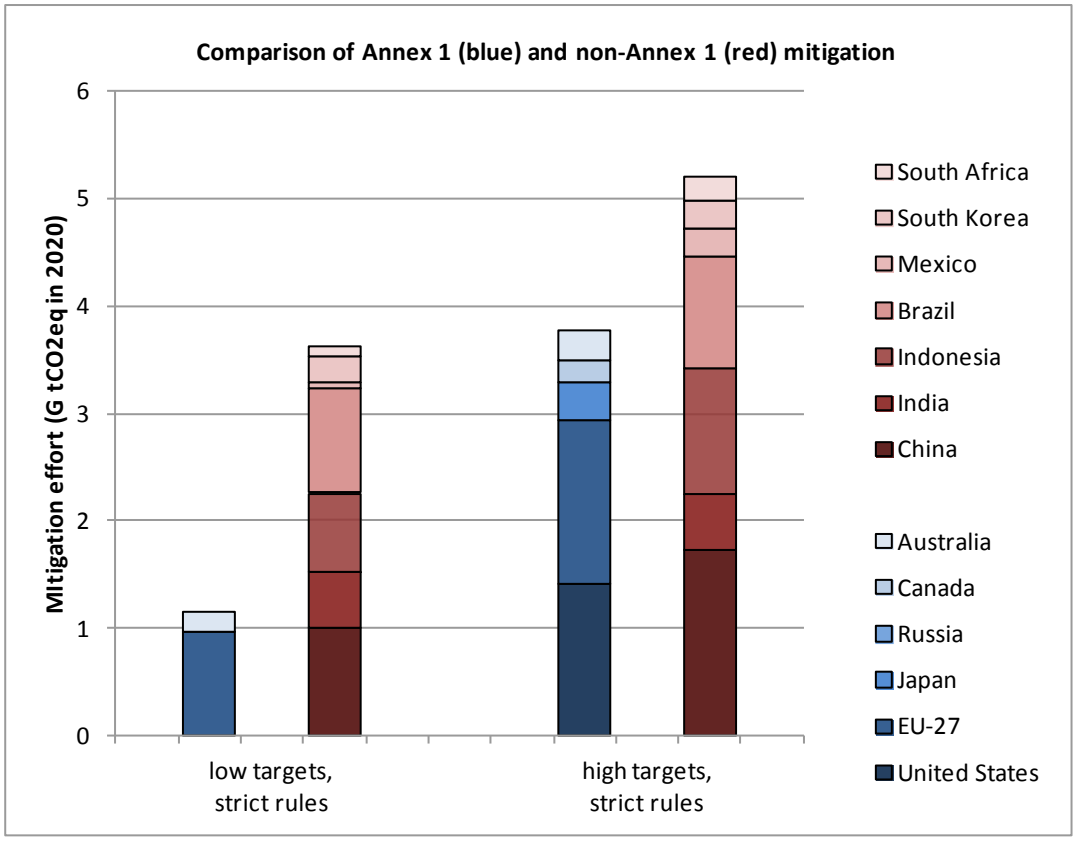
The figures presented here are the median estimates of the country pledges as calculated from the detailed country data presented in the UNEP Report's Appendix 2 (and compiled in its underlying spreadsheets). This bottom up calculation is done for each country by taking the pledged mitigation estimated in each study (i.e., the study's pledged emissions for that country subtracted from the same study's BAU emissions for that country), and then calculating the median across studies of these mitigation estimates. It avoids the statistical contrivance of subtracting the median of one aggregate sample set (i.e., the pledge cases from multiple studies) from the median of a different aggregate sample set (i.e., the BAU cases of multiple studies), and eliminates the sensitivity to the particular algorithm used to "harmonize" the underlying studies in a meta-analysis. (Needless to say, the bottom-up calculation used here produces different results than one would achieve if simply subtracting aggregate median figures such as those shown in Table A1 in Appendix 1 of the UNEP report. Recent analysis soon to be published by the UNEP report's authors notes this methodological issue and offers adjusted results based on a calculation that avoids doing this.)

[3] Here, "low pledges" refers to the UNEP report's "unconditional" cases, and "high pledges" refers to its "conditional" cases. Also, as noted above, UNEP report does not include the conditional pledges of the United States, Japan, and Canada in its "low pledges" cases.

Figure 2 (and Table A2 in the appendix) shows the results disaggregated by individual countries in the "low pledges, strict rules" and "high pledges, strict rules" cases. It shows the median estimate across the studies included in the UNEP analysis of the reductions resulting from each country's mitigation pledges.

Several of the studies in the UNEP meta-analysis attempted also to quantify additional domestic policies that are not encompassed by the national pledges. The median estimates are about 0.5 $GtCO_2e$ for India and about 0.7 $GtCO_2e$ for China, and are included in Figure 2 and Table A2.

Figure 2: Country mitigation pledges, taken from UNEP (2011)



The cases shown are "low pledges, strict rules" and "high pledges, strict rules".

Climate Action Tracker (Climate Analytics et al. 2010; Chen et al. 2011; Höhne et al. 2011)

Climate Action Tracker provides aggregate figures for Annex 1 and non-Annex 1, as shown in Figure 1. Its results, unlike most of the others, include the impacts of LULUCF accounting methodologies in the calculation of Annex 1 targets, diminishing them by about 0.5 $GtCO_2e$ in 2020. It does not include the impacts of surplus allowances, however, although it does note that "the surplus emission allowances from the 2008-2012 period have the potential to completely eradicate the 2020 reduction pledges of developed countries as a whole," and further notes that the surpluses "would not be exhausted until 2025-2030" (Chen et al. 2011, p.2). Previous analyses of the surplus allowances have often underestimated their impact, by assuming that they would be deployed at a constant rate across the entire second commitment period, whereas they would presumably be deployed in a more strategic manner, to match the rise in emissions. The significance of this strategic deployment of surplus allowances had been recognized (e.g. Kartha 2010) and incorporated into some studies (e.g. Point Carbon

2009), but it has not been accounted for in most analyses to date of the effect of surplus allowances on 2020 emission levels.

The two cases considered by Climate Action Tracker and presented in Figure 1 are:

- Low pledges: lower set of pledges (including LULUCF reduction pledges, but not including "national plans"). This case includes countries that have only a conditional pledge (e.g., United States, Japan, Canada), in contrast to the UNEP analysis.
- High pledges: higher set of pledges (conditional pledges, including "national plans").

McKinsey Climate Desk v2.1 (2011) with additional analysis by SEI

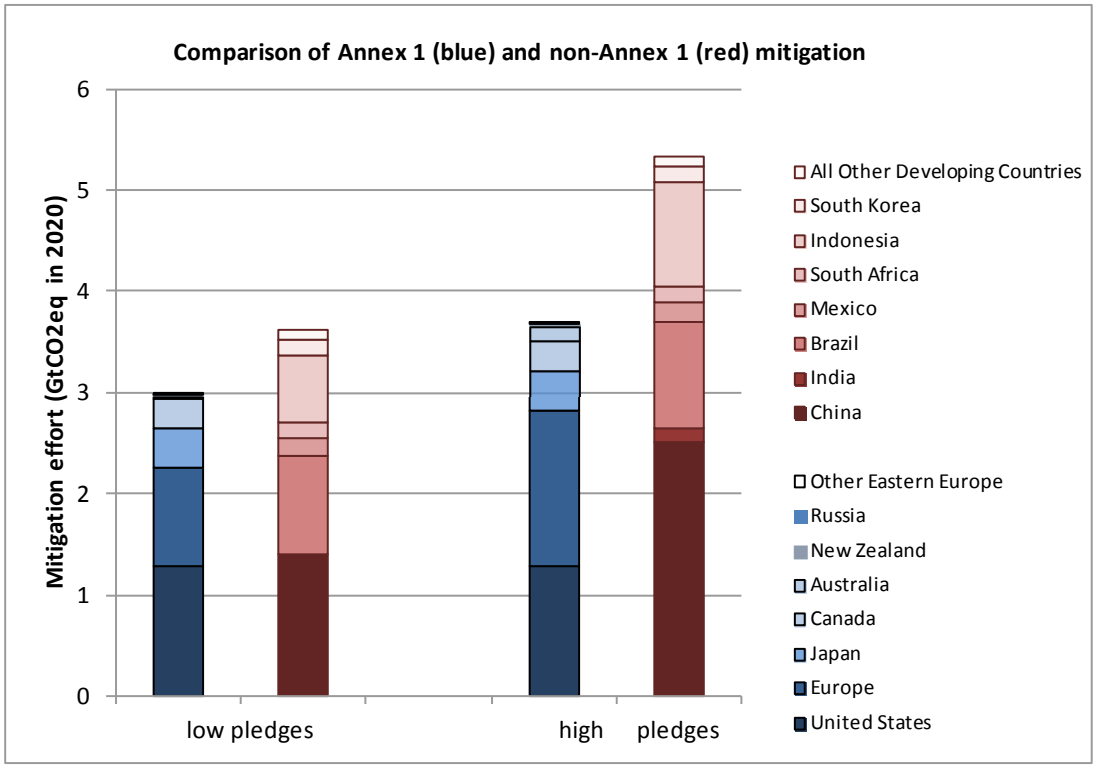
The McKinsey Climate Desk v2.1 has become a widely used reference for both BAU and mitigation emission trajectories. The results presented in Figure 1 are taken from the standard BAU projections of the Climate Desk database, coupled with an analysis by Erickson et al. (2011) of the pledges as recorded in UNFCCC (2011a) and UNFCCC (2011b) (the ".inf" documents). The cases presented above are:

- Low pledges: lower set of pledges (unconditional pledges)
- High pledges: higher set of pledges (conditional pledges)

Figure 1 also shows the estimate generally presented in the work of McKinsey and Project Catalyst "emissions for 2°C pathway (450 ppm) pathway" amounts to ~14 $GtCO_2e$ of mitigation in 2020.

The McKinsey data and the SEI analysis provide a basis for comparing individual countries' mitigation efforts, as shown in Figure 3 (and reported in Table A3).

Figure 3: Country mitigation pledges, from McKinsey Climate Desk v2.1 (2011) and SEI (2011)



The cases shown are "low pledges" and "high pledges".

Jotzo (2010)

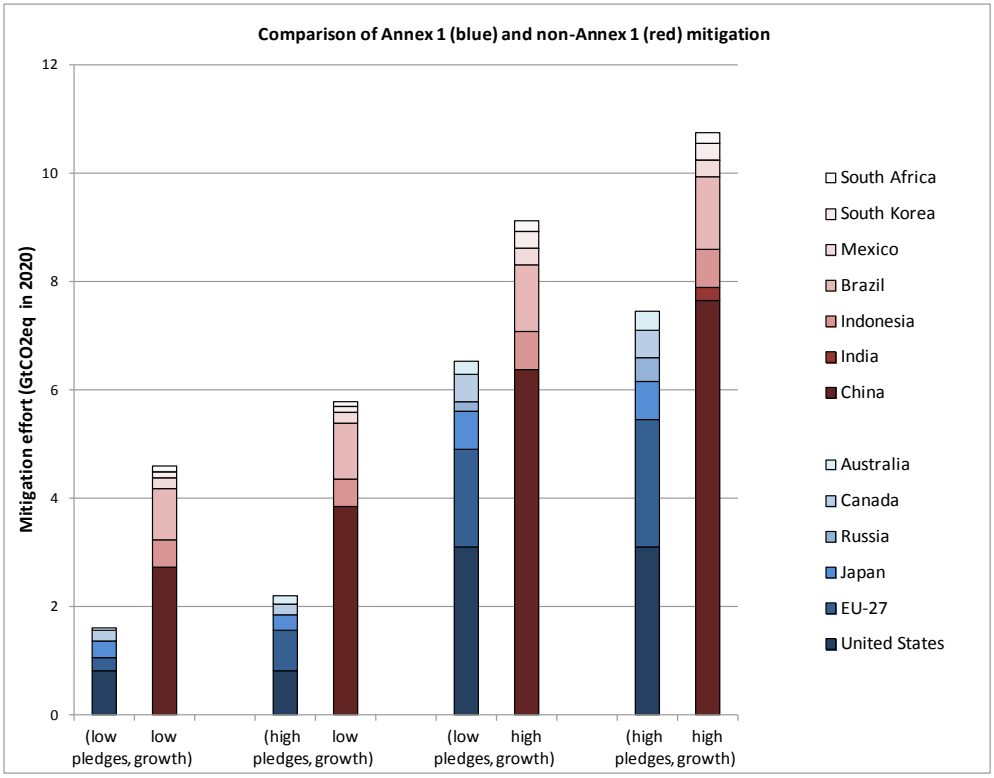
Comparing the Copenhagen emissions targets is a comprehensive analysis that included developing new baselines that are more reflective of recent growth patterns. It comprises 13 large countries or regions that have submitted pledges, including six from Annex 1 and seven from non-Annex 1. Together, the report notes, these 13 countries accounted for just over two thirds of global GHG emissions in 2005, about one third of the total from the six Annex 1 countries and regions and another third from the seven non-Annex 1 countries.

The results presented in Figure 1 are taken from Table 9 in Jotzo (2010), who considers low targets (the lower set of pledges under the Copenhagen Accord) and high targets (the higher set of pledges under the Copenhagen Accord), against three different BAU scenarios: low estimate of future economic growth and emissions, central estimates of future economic growth and emissions, and high estimate of future economic growth and emissions). Here we have displayed the following of Jotzo's cases:

- Case 1: low pledges, low BAU growth
- Case 2 high pledges, low BAU growth
- Case 3: low pledges, high BAU growth
- Case 4: high pledges, high BAU growth.

In all cases, developing country pledges amount to more mitigation than developed country pledges. The report does not provide an estimate of the level of mitigation required to be consistent with a 2°C pathway, but since BAU emissions are assumed to be higher than the other studies, one can infer that the required mitigation is correspondingly higher. Jotzo's two high BAU cases would have a higher required level of mitigation than the low BAU cases. As shown in Figure 4 (and Table A4 in the Appendix), the study further provides a basis for comparing individual countries' mitigation efforts, derived from its Tables 8 and 9.

Figure 4: National mitigation pledges, calculated from Jotzo (2010)



Cases shown are for low pledges and high pledges, and for low growth and high growth.

DISCUSSION

All the reviewed studies conclude that developing country pledges amount to more absolute mitigation than the developed country pledges.

They also all note, although only the UNEP study makes explicit, that unless UNFCCC accounting rules for Annex 1 countries are made more strict (especially with respect to LULUCF accounting and use of surplus allowances), then Annex 1 countries pledges will be able to formally comply with their pledges with very little actual mitigation, and possibly with none at all.

Raising the environmental effectiveness of the climate regime thus requires not only deeper mitigation commitments, but also a concerted effort to tighten the accounting rules.

Is it fair to compare developed and developing country pledges in terms of reductions below BAU?

Might this comparison be biased against Annex 1 countries? One might claim that their BAU emissions growth has already been lowered, by virtue of the ongoing effects of the action they have already taken to "decouple" their economic growth from carbon emissions, and thereby comply with their Kyoto Protocol targets. Hence, one might argue, Annex 1 pledges are being judged relative to a stricter standard than non-Annex 1 pledges.

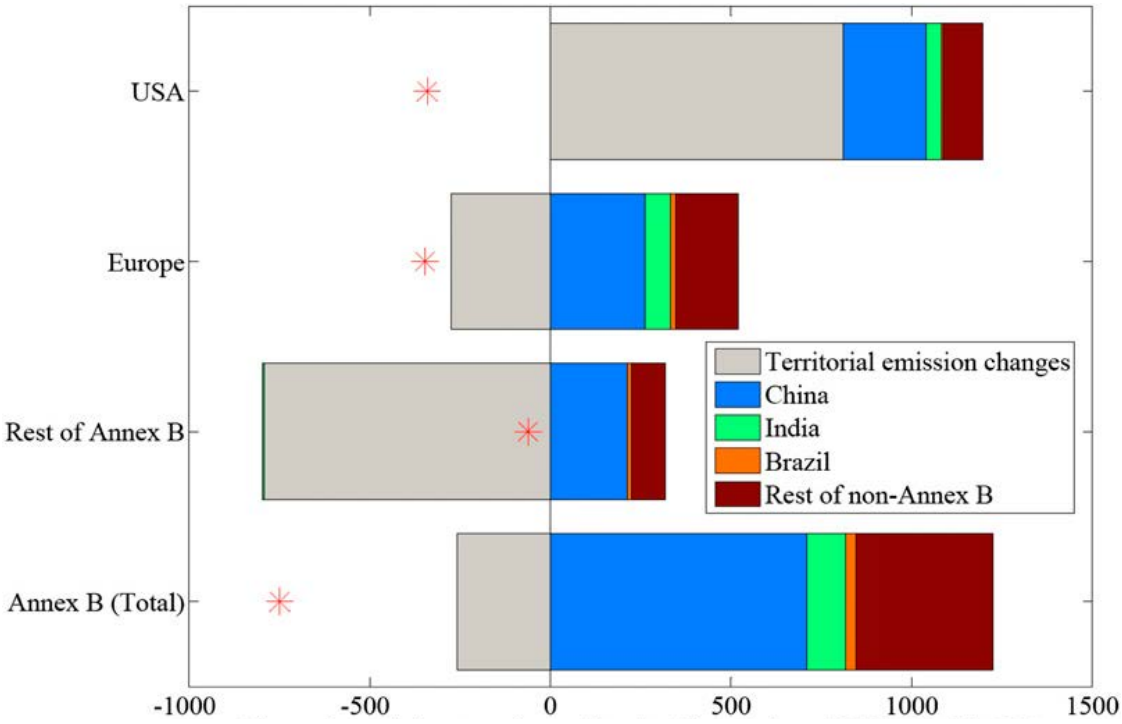
There are several responses to this claim: First, this argument cannot be made about Annex 1 countries (such as United States, Canada) that have made only minimal efforts to cut their emissions. Second, neither can this argument apply to countries (Russia, Ukraine, etc.) that negotiated Kyoto targets that were well above their projected emissions paths and required no mitigation effort for compliance.

Third, a large portion of the actions taken by countries that did seek to reduce emissions under the Kyoto Protocol involved "no-regrets" mitigation. These are actions that provide net economic benefits, and those benefits – whether the lower fuel costs of more efficient capital, or reduced pollution and public health expenditures from cleaner technologies, or improved energy security, etc. – continue to accrue to those countries.

Fourth, as shown by Peters et al. (2011), Annex 1 countries have not, in fact, "decoupled" their consumption from emissions, but rather they have shifted many of those emissions to developing countries where goods are now produced. As shown in the Figure 5 below, taken from Peters et al. (2011), the United States, Europe, the rest of Annex 1, and Annex 1 as a whole, have all seen increases in their net imports of embodied carbon from developing countries, and these increases exceed their Kyoto targets.[4]

[4] Note that Peters et al. (2011) explicitly does *not* claim that this shift in emissions has been caused by climate policy. The authors write: "Based on existing general computable equilibrium studies of (strong) carbon leakage, it is likely that existing national or regional climate policies themselves — such as the European Emission Trading Scheme — have had a minimal effect on international trade. If these modeling studies are robust, they suggest that other economic and policy factors have determined past production decisions (and hence emission transfers), which is also consistent with the broader literature on this topic. Based on this theory, the likely cause of the large emission transfers we report here are preexisting policies and socioeconomic factors that are unrelated to climate policy itself. As an example, we find that both the United States and European Union have had a large increase in net emission transfers, but only the European Union has a broad-based climate policy."

Figure 5: Change in emission transfers and territorial emissions, 1990-2008 ($MtCO_2$)



Source: Peters et al. (2011, p.4). Note that to the extent that the developed world has achieved any decrease in territorial emissions since 1990 (grey), this decrease is more than countered by the growth in net imported embodied carbon. This analysis suggests that consumption and emissions have not been decoupled in the developed world. Finally, and perhaps most importantly, it appears that the country that is most disadvantaged by analyses that fail to account for existing climate policy is China, rather than any Annex 1 country. As Jotzo makes clear, the existence of very substantial emission-reducing policy in China is taken for granted in many standard BAU projections, including those of the International Energy Agency and the U.S. Energy Information Agency, on which many other studies have based their BAU projections.[5]

What share of total reductions should developed and developing countries pledge?

Some may claim that it does not reflect inequitable effort-sharing for developed countries to have pledged less mitigation than developing countries. Two points may be put forward to support this claim. First, the developing country pledges are conditional, at least in part, on developed country support, and thus cannot be considered solely the effort of developing countries. Second, the majority of global emissions now arise from developing countries, and most mitigation must ultimately occur in developing countries; thus their pledged efforts should naturally be greater than those of developed countries.

With regard to the first argument, it is worth examining how developed country pledges compare to the *low* pledges of developing countries, which studies tend to interpret as the unconditional pledges. We see (from Figure 1 and Table A1), that for all four studies, the low

[5] As Jotzo writes: "Following China's emissions intensity reduction pledge, some observers noted that significant policy effort would be necessary (Qiu 2009, Chandler and Wang 2009), while others claimed that the intensity target amounts to little more than business-as-usual (e.g. Houser 2010, Levi 2009). Such judgments have typically been based on reference case projections by the International Energy Agency, or in some cases the US Energy Information Administration. As discussed above, it is problematic to brand these projections as BAU scenarios, as they assume that all existing policies are continued and fully implemented as part of BAU. In the case of China, projections include a host of policies and programs that will result in lower energy use and lower carbon intensity of energy use. Examples are policy support for renewable and nuclear power generation, and large-scale programs to shut down inefficient industrial plants (NDRC 2008). Subsuming these under BAU yields an inaccurate picture of what Chinese emissions would be like without dedicated policy action."

pledges of developing countries are either much larger than the high pledges of developed countries (UNEP "lenient rules," Climate Action Tracker, Jotzo "low BAU" and Jotzo "high BAU") or essentially equal to them (UNEP "strict rules" and McKinsey/SEI). Thus, it cannot be claimed that the pledged efforts of developing countries appear higher than developed countries' pledged efforts only because they include developed country support.

Consider the second argument, that developing country efforts should be greater than those developed countries because it is in developing countries that most mitigation must occur. This argument confuses the need to *efficiently* distribute mitigation with the need to *equitably* distribute effort. As is well known, the two can be decoupled. Much of the period since Kyoto has been devoted to developing mechanisms (such as the CDM and the European Emissions Trading System) that are designed to enable one country to pay for mitigation in another country. Similarly, much of the attention in the current round of negotiations is devoted to designing and operationalizing the Green Climate Fund, also to enable one country to pay for mitigation (and adaptation) in another country. To suggest that developing country mitigation pledges should be greater than developed country is to unnecessarily conflate efficiency and equity.

So, what would be an equitable allocation of mitigation effort? There are several strong arguments for asking developed countries to do considerably more, not less, than developing countries, starting with the foundational principles of the UNFCCC:

> The Parties should protect the climate … on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof. (United Nations 1992, Article 3)

If we consider developed countries' responsibility for the climate problem, then it makes sense to consider not just their direct emissions, but also emissions in developing countries that arise from activities that produce goods for consumption in developed countries. Under a "consumption-based" accounting of emissions, developed countries are responsible for about 60 percent of global emissions.[6]

Furthermore, climate change is caused not just by today's carbon emissions, but by carbon accumulated in the atmosphere due to years of emissions. If you gauge emissions on a historical basis, developed countries are responsible for more than 75 percent.

If we talk of countries' *capability* with respect to solving the climate problem, it is clear that the great majority of financial and technological wherewithal resides in the North. The developed world controls approximately three-quarters of the world's GDP. If one takes into account that a much higher fraction of GDP goes toward meeting very basic needs, such as food, shelter, and medical care, then the North controls more like six-sevenths of the world's discretionary GDP.

Accounting for much greater responsibility and capacity of the developed world, it seems self-evident that the developed world should take responsibility for much more mitigation effort than the developing world, and that this effort must have both a domestic and an international dimension. The effort undertaken domestically would demonstrate that low-carbon development is feasible and attractive, and that a rapid transition is possible. The equally important effort undertaken internationally would take the form of financial and

[6] The data underlying the statements in this section regarding carbon emissions, consumption-based emissions, historical emissions, GDP, and discretionary GDP, can all be found at www.GreenhouseDevelopmentRights.org, and downloaded through the online Greenhouse Development Rights calculator.

technological support to developing countries, to enable them to design and shift to their own low-carbon development paths.

Finally, as all the studies have noted, the mitigation pledged globally puts us on track toward much more than 2°C of warming – possibly as much as 5°C. Given the urgency of the climate crisis, it is necessary to emphasize that while this analysis concludes that developed countries are not doing enough, it does not conversely imply that developing countries are doing too much.

Clearly, developed countries must raise their level of ambition to the levels demanded by science and equity. And, of course, they must fulfill those ambitions through actual mitigation, not though accounting loopholes.

But the uncompromising mathematics of the severely limited global carbon budget make clear that developed countries alone cannot prevent dangerous climate change. Developing countries must also raise their level of ambition. And, with the necessary institutions of technological cooperation and financial support in place, developed and developing countries must then work together to fulfill those ambitions.

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APPENDIX

Table A1: Annex 1 and non-Annex 1 mitigation pledges in 2020, in $GtCO_2e$ (as shown in Figure 1), from the four studies.

	Annex 1	non-Annex 1
UNEP		
low pledges / lenient rules	0.0	3.6
low pledges / strict rules	1.2	3.6
high pledges / lenient rules	1.7	5.2
high pledges / strict rules	3.8	5.2
global mitigation for 2°C path		12
Climate Action Tracker		
low pledges	0.7	2.3
high pledges	1.7	4.9
global mitigation for 2°C path		14
McKinsey (Climate Desk 2.1) & SEI		
low pledges	3.0	3.6
high pledges	3.7	5.3
global mitigation for 2°C path		14.0
Jotzo		
low pledges / low BAU	1.6	4.6
high pledges / low BAU	2.2	5.8
low pledges / high BAU	6.5	9.1
high pledges / high BAU	7.4	10.7

Table A2: National mitigation pledges, based on UNEP (2011), Appendix 2, *Detailed information about Countries' Pledges*

	$MtCO_2e$ in 2020	
	low pledges strict rules	**high pledges strict rules**
United States	0	1407
EU-27	972	1529
Japan	0	358
Russia	0	0
Canada	0	200
Australia	185	280
Annex 1	**1157**	**3773**
China	1010	1730
India	523	523
Indonesia	733	1156
Brazil	974	1051
Mexico	51	265
South Korea	244	244
South Africa	88	238
Non-Annex 1	**3623**	**5207**

Table A3: National mitigation pledges, based on McKinsey Climate Desk v2.1 (for BAUs) and SEI (Erickson et al. 2011) for pledge analysis

	$MtCO_2e$ in 2020	
	low targets	**high targets**
United States	1289	1289
Europe	973	1535
Japan	379	379
Canada	297	297
Australia	28	138
New Zealand	19	28
Russia	0	0
Other Eastern Europe	7	7
Annex 1	**2991**	**3673**
China	1392	2500
India	0	149
Brazil	975	1052
Mexico	183	183
South Africa	158	158
Indonesia	653	1029
South Korea	162	162
All Other Developing Countries	99	99
Non-Annex 1	**3622**	**5332**

Table A4: National mitigation pledges, based on Jotzo (2010)

	$MtCO_2e$ in 2020			
	low pledges low growth	**high pledges low growth**	**low pledges high growth**	**high pledges high growth**
United States	800	800	3100	3100
EU-27	250	750	1800	2340
Japan	300	300	700	700
Russia	0	0	175	450
Canada	200	200	500	500
Australia	55	145	249	351
Annex 1	**1605**	**2195**	**6524**	**7441**
China	2720	3840	6364	7636
India	0	0	0	250
Indonesia	500	500	700	700
Brazil	960	1040	1248	1352
Mexico	200	200	300	300
South Korea	100	100	300	300
South Africa	100	100	200	200
Non-Annex 1	**4580**	**5780**	**9112**	**10738**

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